Association of UV radiation with Parkinson's disease incidence: A nationwide French ecologic study

A Elbaz, K Sofiane, Lucien Wald, A Dugravot, A Singh-Manoux, F Moisan, A Kravietz

Association of UV radiation with Parkinson's disease incidence: A nationwide French ecologic study

A. Elbaz, K. Sofiane, L. Wald, A. Dugravot, A. Singh-Manoux, F. Moisan, A. Kravietz (Villejuif, France)

Meeting: 20th International Congress

Abstract Number: 467

Keywords: Environmental toxins

Session Information

Date: Monday, June 20, 2016

Session Time: 12:30pm-2:00pm

Session Title: Epidemiology

Location: Exhibit Hall located in Hall B, Level 2

Objective: Using ultraviolet B (UV-B) as a surrogate for vitamin D levels, we conducted a nationwide ecologic study in France in order to examine the association of UV-B exposure with Parkinson's disease (PD) incidence.

Background: In addition to regulating calcium homeostasis and bone metabolism, vitamin D is involved in multiple biological pathways. Lower vitamin D is associated with increased mortality, in particular from cancer, and there is increasing evidence that it may play a role in brain health, including Alzheimer's disease, cognitive decline, multiple sclerosis, and PD. Exposure of the skin to UV-B from sunlight is the most important source of vitamin D, and a good surrogate marker of vitamin D levels in population settings.

Methods: We used French national drug claims databases to identify PD cases using a validated algorithm. UV-B data from the solar radiation database were derived from satellite images. We estimated PD incidence (2010-2012) at the canton level (small administrative French unit) and used multilevel Poisson regression including a random intercept per canton to examine its association with UV-B (2005 annual average), after adjustment for age, sex, deprivation index, smoking, proportion of agricultural land, and vitamin D supplementation.

Results: Analyses are based on 69,010 incident PD patients. PD incidence increased with age and was higher in men than women. The association between UV-B and PD incidence was quadratic ($P<0.001$) and modified by age ($P<0.001$) but not by sex ($P>0.15$). Below 70 years, incidence was higher in the bottom quintile (RR-Q1-45-49y=1.209, 95% CI= 1.108-1.320) compared with the middle UV-B quintile, and lower in the top quintile (RR-Q5-45-49y=0.883 [0.802-0.972]). The opposite pattern was observed in older subjects (RR-Q1-85-89y=0.941 [0.903-0.981]; RR-Q5-85-89y=1.102 [1.057-1.150]). Analyses based on continuous UV-B yielded similar conclusions.

Conclusions: In this nationwide ecologic study, there was an age-dependent quadratic association between UV-B and PD incidence. This study suggests that low UV-B exposure is associated with higher PD risk in younger persons, but not in older persons, and that future studies should examine dose-response relations and take age into account.

A. Elbaz, K. Sofiane, L. Wald, A. Dugravot, A. Singh-Manoux, F. Moisan, A. Kravietz. Association of UV radiation with Parkinson's disease incidence: A nationwide French ecologic study [abstract]. *Mov Disord*. 2016; 31 (suppl 2). http://www.mdsabstracts.org/abstract/association-of-uv-radiation-with-parkinsons-disease-incidence-a-nationwide-french-ecologic-study/. Accessed June 22, 2016.

MDS Abstracts - http://www.mdsabstracts.org/abstract/association-of-uv-radiation-with-parkinsons-disease-incidence-a-nationwide-french-ecologic-study/